



PS200/PS300™ User Manual

Versatile Automated Programming System

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Data iO

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Safety Summary

This summary contains general safety information for Operators. In addition, specific **WARNINGS** and **CAUTIONS** appear throughout this manual where they apply and are not included in this summary.

| | |
|------------------------------|--|
| Moving Parts | To reduce the risk of injury from pinch points, keep hands and fingers away from handler mechanisms while they are in operation. |
| Laser | To reduce the risk of injury from invisible laser radiation, observe all safety precautions. All service procedures should be completed as described in the PS200/PS300 Service Manual . |
| Ventilation | To avoid hazardous working conditions or programmer malfunction, operate the PS200/PS300 in a well-ventilated area. |
| Hazardous Residues | To avoid the inadvertent disposal of in-line vacuum “smoke” filters as normal trash, ensure that all filters are handled as a hazardous waste, meeting all applicable local, state, and federal requirements. |
| Definitions | WARNING statements identify conditions or practices that could result in personal injury or loss of life. CAUTION statements identify conditions or practices that could result in damage to equipment or other property. |
| Fuse Replacement | For continued protection against the possibility of fire, replace the fuse only with a fuse of the specified voltage, current, and type ratings. |
| Grounding the Product | The product is grounded through the grounding conductor of the power cable. To avoid electric shock, connect the power cable into a properly wired and grounded receptacle only. Grounding this equipment is essential for its safe operation. |
| Power Cable | Use only the power cable supplied with your equipment. |
| Power Source | To avoid damage, operate the equipment only within the specified line (AC) voltage. |
| Servicing | To reduce the risk of electric shock, perform only the servicing described in the PS200/PS300 Service Manual . |

Symbols



This symbol indicates that the user should consult the manual for further detail.



This symbol stands for Vac, for example, 120V \sim = 120 Vac.



This symbol denotes a fuse rating for a user-replaceable fuse.



This symbol denotes a protective ground connection.



This symbol denotes the presence of a radiation emitting laser device. Laser safety precautions should be taken to prevent personal injury.



This symbol denotes the presence of high voltage in the associated electrical equipment.



This symbol denotes that there is a potential hazard for bodily injury from impact or crushing by moving parts.



This symbol denotes that there is a potential hazard for bodily injury from pinching by moving parts.



This symbol denotes that the equipment surface may be hot and there is a potential hazard for bodily injury from being burned if touched.



This symbol denotes an emergency stop button that immediately stops all equipment motion when it is pressed.



This symbol denotes an electrostatic grounding receptacle to connect static discharging equipment (such as an anti-static wrist strap).

Preface

The Preface describes how to contact Data I/O for technical assistance, repair and warranty services. It also describes how to access Data I/O's Web site on the World Wide Web.

Data I/O Customer Support

United States

For technical assistance, repair or warranty service, contact:

Data I/O Channel and Customer Support
Telephone: 1-800-3-DATAIO (then follow the prompts)
Fax: 425-867-6972
E-mail: pmhelp@dataio.com

Data I/O Corporation
10525 Willows Road NE
P.O. Box 97046
Redmond, WA 98073-9746

Canada

For technical assistance, repair or warranty service, contact:

Data I/O Customer Resource Center
Telephone: 905-678-0761
Fax: 905-678-7306

Data I/O Canada
6725 Airport Road, Suite 102
Mississauga, Ontario, L4V 1V2
Telephone: 905-678-0761
Fax: 905-678-7306

Japan

For technical assistance, repair or warranty service, contact:

Data I/O Japan
Saisho Building 7F
8-1-14, Nishigotanda
Shinagawa-ku
Tokyo 141-0031 Japan
Telephone: 3-3779-2151
Fax: 3-3779-2203

Germany

For technical assistance, repair or warranty service, contact:

Data I/O GmbH
Lochhamer Schlag 5
82166 Gräfelfing
Telephone: 89-858-580
Fax: 89-858-5810
E-mail: servicegmbh@data-io.de

Other Countries

For technical assistance, repair or warranty service, contact your local Data I/O representative. To find your local Data I/O representative, go to the Data I/O Web site (www.dataio.com) and use the Representative Search feature.

Contacting Data I/O

You can contact Data I/O for technical assistance by calling, sending a fax or sending electronic mail (e-mail).

To help us give you quick and accurate assistance, please provide the following information:

- Product version number
- Product serial number if available
- Detailed description of the problem you are experiencing
- Error messages (if any)
- Device manufacturer and part number (if device related)

Telephone

Call the appropriate Data I/O Customer Support number listed in this Preface. When you call, please be at your programmer or computer, have the product User Manual nearby, and be ready to provide the information listed above.

Fax

Fax the information listed above with your name, phone number, and address to the appropriate Data I/O Customer Support fax number listed in this Preface.

E-mail

To reach Data I/O via e-mail, send a message including your name, telephone number, e-mail address, and the information listed above to the following address:

pmhelp@dataio.com

World Wide Web (www.dataio.com)

The Data I/O Web site includes links to online information about technical products, general information about Data I/O, a list of sales offices, a Representative Search feature, and technical user information such as application notes and device lists.

To access the Data I/O Web site, you need an Internet account with Web access, and a Web browser. The address of Data I/O's Web site is:

<http://www.dataio.com>

Warranty Information

Data I/O Corporation warrants this product against defects in materials and workmanship at the time of delivery and thereafter for a period of one (1) year. The foregoing warranty and the manufacturers' warranties, if any, are in lieu of all other warranties, expressed, implied, or arising under law, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose.

Data I/O maintains customer service offices throughout the world, each staffed with factory-trained technicians to provide prompt, quality service. For warranty service, contact Data I/O Customer Support at the numbers listed in this Preface.

Repair Service

After the warranty period expires, repair services are available at Data I/O Service Centers on a time-and-materials basis, and through a fixed price annual agreement that covers all parts and labor needed to correct normal malfunctions. The annual agreement includes semiannual performance certification.

For more information or to order a Repair Service Contract, call Data I/O Customer Support.

End User or Address Change

If the end user for this product or your address has changed since the Registration Card was mailed, please notify Data I/O Customer Support at the numbers listed at the front of the Preface. This ensures that you receive information about product enhancements. Be sure to include the product serial number, if available.

1 Introduction

The PS200/PS300 is an automated production programming system designed to program a wide variety of devices such as EPROM, FLASH, logic, and microcontrollers in volume. Supported package types include DIP, PLCC, BGA, fine-pitch packages (TSOP, QFP, and TQFP) and CSP packages (MBGA, EZBGA, FBGA, and CBGA). This high-performance, high-accuracy system uses JEDEC trays, tubes, and tape feeders for maximum processing and sorting capability, whatever the application. The PS200/PS300 moves unprogrammed devices from input media through a programming and optional marking process to output media for delivery to the next phase of your production process.

While similar, there are some differences between the PS200 and PS300. The PS300 system is designed for volume programming of higher density devices such as Flash memory and is configured with a high-performance Pentium controller and FlashTOPs to provide the fastest possible programming times.

As the Operator, you set up the PS200/PS300 to perform operations using the programming setup and process control software. The software commands the PS200/PS300 to perform a series of process steps, including pick and place routines, programming, and marking.

This **PS200/PS300 User Manual** is written for Operators. Chapter 1 *Introduction* provides an overview of the PS200/PS300 system and presents important safety information. Chapter 2 *Setup* describes how to prepare the system to run a job. Chapter 3 *Operations* describes steps involved in running jobs. Chapter 4 *Monitoring* describes the features of the PS200/PS300 that allow you to monitor job progress. Chapter 5 *Troubleshooting* describes how to recover from error conditions during operation.

Note: The information in this manual applies to PS200/PS300 systems running software version 3.8.0 and higher.

As a PS200/PS300 Operator, you must understand the basics listed below before processing devices on the PS200/PS300. Refer to page numbers in this chapter as shown.

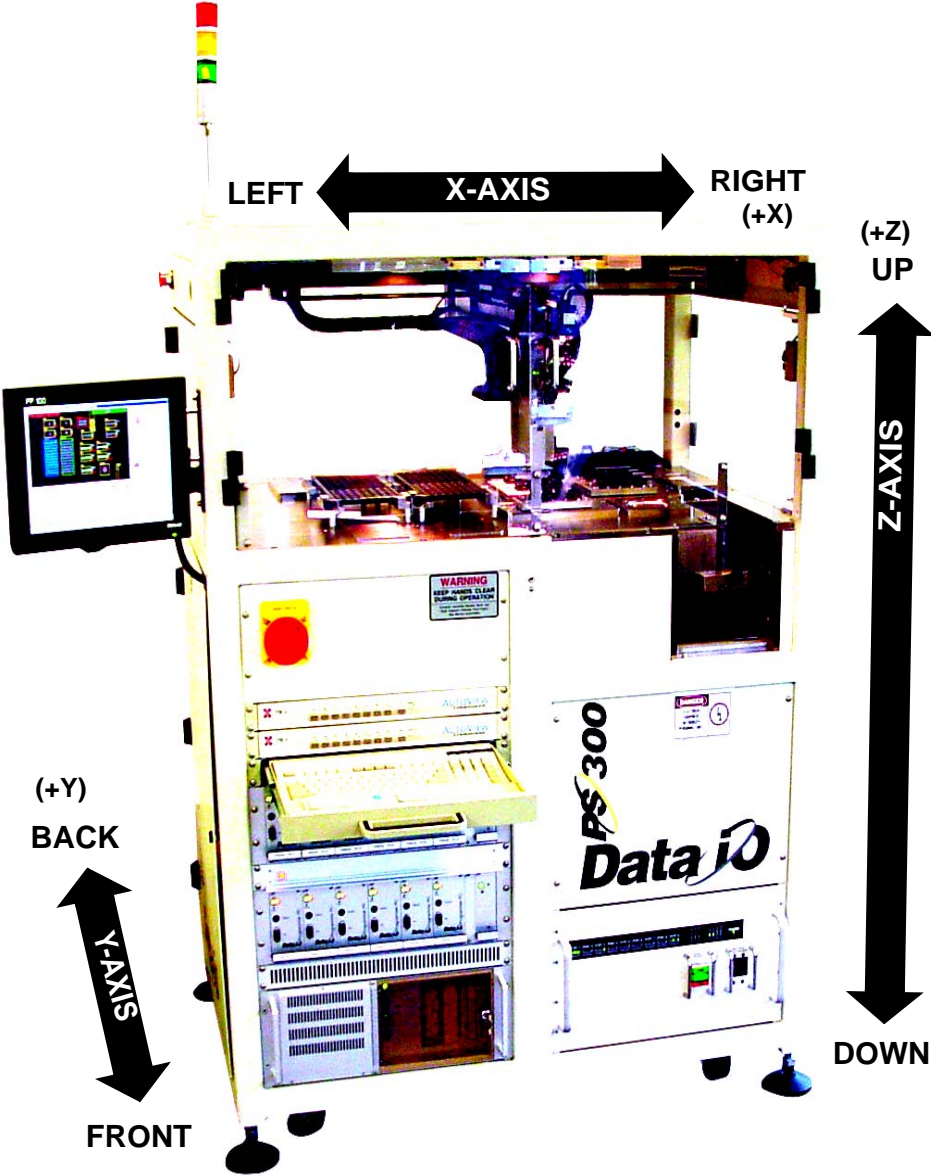
Operators Must Know:

- “Terms Used to Indicate Direction” on page 1-2
- “The Four Basic Operations” on page 1-3
- “System Features” on page 1-4
- “Safety Controls” on page 1-5
- “Electrical Power Controls” on page 1-6
- “Programmers” on page 1-6
- “Marking Options” on page 1-6
- “Light Tower” on page 1-7
- “Operator Interface” on page 1-8
- “Precautions for Safe Operation of the PS200/PS300” on page 1-10
- “Handling Devices Safely” on page 1-12

Terms Used to Indicate Direction

The terms in Figure 1-1 describe movement and directions in relation to the PS200/PS300 as you face the front of it.

Figure 1-1. Terms Indicating Movement and Direction



The Four Basic Operations

The PS200/PS300 performs the following four basic operations to process devices:

1. Unload Devices from Input Module

The Pick-and-Place (PNP) robot unloads devices from input tube, input tray, or carrier tape modules. These devices are placed in either a programmer socket or on the marker pedestal.

2. Program Devices

If configured, blank devices in the programmer's sockets go through a series of pre-programming tests to make certain they are blank and are correctly inserted in the sockets. If they pass these tests, the devices are programmed using the semiconductor manufacturer's exact algorithm specifications from the data loaded in the programmer's RAM.

Data in devices that pass the programming operation are verified against the original data to ensure that they have been programmed correctly.

3. Laser Mark or Label Devices

If you select this operation, devices that pass the program and verify operations are moved to a pedestal on the laser marker or labeler, and then marked for identification.

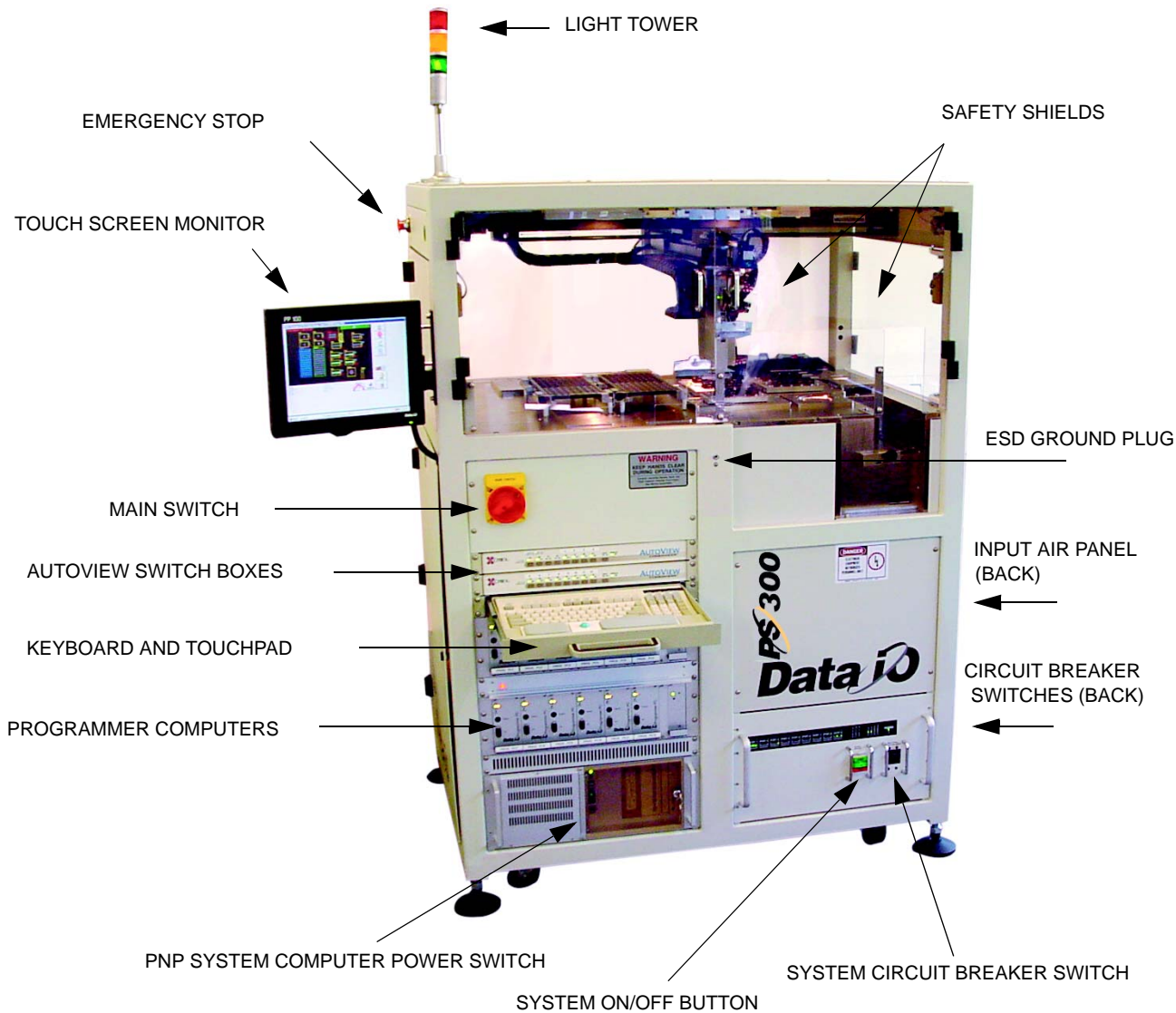
4. Load Devices onto Output Module

All devices are moved by the PNP robot from the programmer socket or the laser marker and placed in either trays, tubes, or tape output modules. Devices that fail the programming operation are transported to a dedicated reject tray or other designated reject module where they are held for failure analysis or other disposition.

System Features

The external features of the PS200/PS300 are shown in Figure 1-2. These and the other major system components are mentioned throughout this manual.

Figure 1-2. Major External Features on the PS200/PS300



| Component | Page |
|---------------------------------|------|
| Safety Controls | 1-5 |
| Electrical Power Controls | 1-6 |
| Light Tower | 1-7 |

Safety Controls

The safety and power controls are described below.

Safety Shields and Interlocks

During operation, when the high-speed PNP robot is processing devices, the clear plastic safety shields around the system (see Figure 1-2) are closed into their operating position to protect Operators from injury. If a safety shield is opened, the PNP robot will stop motion and will not continue unless the safety shield is closed.

WARNING: The high speed and force behind a moving robot will expose anyone working inside the work envelope to serious bodily injury. Moving the PNP robot must be the responsibility of only one qualified individual. All other personnel near the system must stay clear of the work envelope while the robot is moving.

CAUTION: Do not use solvents (such as acetone, lacquer thinner, mineral spirits, or isopropyl alcohol) or abrasives of any kind on the safety shield surfaces. Use of these products will damage the safety shield surfaces.

Emergency Stop Buttons (E-Stop)



Large, red emergency stop buttons are located on the sides near the top of the PS200/PS300 where they are easy to reach.

When you press an emergency stop button, the PNP robot stops moving immediately. The message “Check Doors/E-Stop!” is displayed on the touch screen monitor.

Figure 1-3. E-Stop Button



To restart the system, turn the E-Stop button clockwise until it springs back to its full height, and clear the “Check Doors/E-Stop!” message from the touch screen monitor by clicking **OK**. The PS200/PS300 will then resume the job without further input from the Operator.

Electrical Power Controls

A yellow and red, lock-out/tag-out **Main Switch** and a **Main Computer Power Switch** are located on the front left of the PS200/PS300. They are usually left in the ON position during working shifts. The **Main Computer Power Switch** may be left on always.

A **System Circuit Breaker Switch** and a **System ON/OFF Button** are located on the front right of the PS200/PS300. The **System ON/OFF Button** must be pressed whenever the **System Circuit Breaker Switch** or the **Main Switch** has been off and then turned back on.

When the **Main Switch** is off, power is turned off to all system components.

 **More Information:**

“Turn On System Power” on page 2-4

“Shut Down the System” on page 3-6

Programmers

The PS200/300 can be configured with 2-12 universal programming sites for memory, logic and micro devices. It can also be configured with up to 48 Flash memory programming sites or any combination of universal and Flash programming sites. See your PS200/300 System Supervisor for information on your system's configuration.

Marking Options

The PS200/300 can contain optional marking bays for labeling and marking devices. Marking options include the APOLLO 1 and CO₂ laser markers. See your PS200/300 System Supervisor for information on your system's configuration.


Light Tower

The light tower allows the Operator to monitor the status of the PS200/PS300 from a distance while the system is processing devices.

The three lights on the tower indicate the following system conditions:

Figure 1-4. Light Tower Indications

| Light Color | Possible Causes | Machine Status | Operator Action |
|----------------------|--|--|---|
| Red (or Blue) | <ul style="list-style-type: none"> ■ E-Stop has been pushed ■ Error condition | <ul style="list-style-type: none"> ■ PS200/PS300 is stopped | <ul style="list-style-type: none"> ■ Requires attention |
| Amber | <ul style="list-style-type: none"> ■ Needs more input devices ■ Needs empty output tray, tube, or tape | <ul style="list-style-type: none"> ■ PS200/PS300 is running or has paused | <ul style="list-style-type: none"> ■ Requires attention |
| Green | | <ul style="list-style-type: none"> ■ PS200/PS300 is running | <ul style="list-style-type: none"> ■ No attention required |

 **More Information:**
“Light Tower” on page 4-2

Operator Interface

During programming operations, you control the PS200/PS300 through either the keyboard and its touch pad, or through the touch screen monitor.

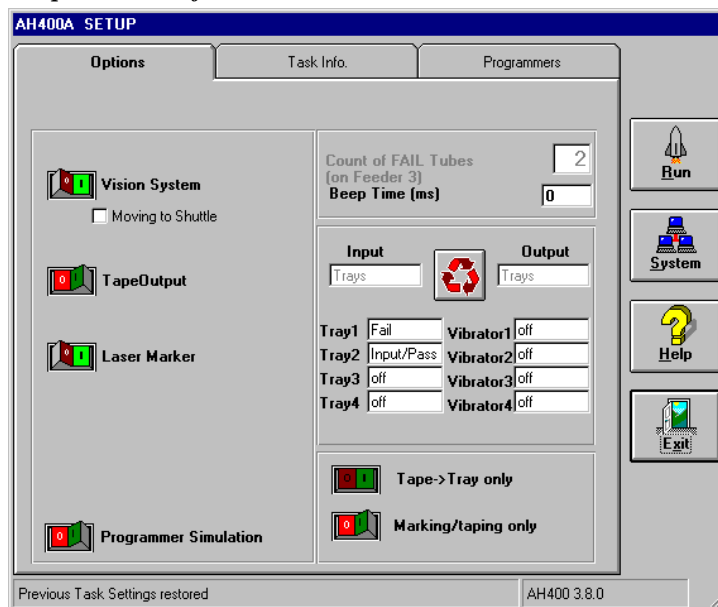
To select a command, you have two options:

1. Use the keyboard and touch pad to move the cursor to the desired location and click the touch pad.
2. Use your finger to quickly press the desired location on the touch screen monitor.

When you select and start a job, the PS200/PS300 is automatically configured, programming data files are transferred from the server to the programmer's RAM, and devices are programmed, verified, and marked. The software tracks system yield and throughput statistics for each socket so system performance can be analyzed.

A sample Operator interface screen is shown in Figure 1-5.

Figure 1-5. Sample Operator Interface Screen



Switching Between Interfaces

The AutoView switch boxes located directly above the keyboard allow you to switch between computers to view the following interfaces:

Upper Switch Box

- **A** - switches the screen to the **Operator Interface** (on the Pick-and-Place System).
- **B** - switches the screen to the **Network Interface** (on the Server Computer).
- **C** - switches the screen to the **Laser Interface** (if this option is installed).
- **D** - switch location not currently used.
- **E through H** - switches the interface to programmers 1-4 respectively.

Lower Switch Box

- **A through H** - switches the interface to programmers 5-12 respectively.

Figure 1-6. AutoView Switch Boxes



Precautions for Safe Operation of the PS200/PS300

The PS200/PS300 system has many safety features designed to make the system safe and efficient to operate. **The system can be dangerous if you ignore the safety precautions and features described in this manual.**

To avoid possible personal injury to you and your coworkers, please observe the following:

- Do not use this system for any application other than its intended use.
- Do not operate the system unless the guards or safety devices are in their normal operating positions.
- Do not operate the system when any of the outer sheet metal panels are removed.
- Only qualified service personnel trained by Data I/O to service and maintain the PS200/PS300 (including laser safety training) should install, maintain, repair, or troubleshoot this system.
- Do not operate the PS200/PS300 unless you have been thoroughly trained and have read and understand the instructions in this manual, particularly those that describe the system's safety features.
- Do not place any part of your body near or in the direct path of moving parts.
- Do not disable or attempt to defeat any of the protective safety features on this system. Serious personal injury and/or equipment damage can occur if a safety shield is disabled. If you suspect that a safety feature on the system is damaged or malfunctioning, immediately stop using the PS200/PS300 and contact your local Data I/O Customer Support office.
- Ensure that the appropriate safety shields and safety doors are in place if the Tube Input option is not in use or if the Tape Input option is not installed. Install and use the Safety Door (Data I/O Part Number 619-0031-XXX) if the Tape Input module is not in use. This door prevents access to the work envelope if the Tape Input module is not in use. Install and use the Front Shield (Data I/O Part Number 643-0050-XXX) if the Tube Input option is not in use. This shield prevents access to the work envelope if the Tube Input option is not in use.

Laser Marker Safety

The laser marker system on the PS200/PS300 has been designed in accordance with the following safety guidelines:

- Operates as Class 1 laser (CDRH classification).
- Fume extractor traps marking fumes and other by-products of the laser marking operation.
- System designed to comply with OSHA guarding standards.
- Integrated interlocks prevent the laser from firing while any interlock on the laser cover is open.
- Refer to and follow the laser and safety precautions in ANSI Z136.1-1993, *American National Standard for the Safe Use of Lasers*. Procedures listed under the Standard include: appointment of a Laser Safety Officer, operation of the product in an area of limited access by trained personnel, servicing of equipment only by trained and authorized personnel, and posting of signs warning of the potential hazards.

WARNING: Blindness! Always wear eye protection when the CO₂ laser safety shields are open, such as during service. Direct or diffuse laser radiation can damage eyes. Goggles must block 10.6 μm, CO₂ laser radiation. Goggles protect against scattered energy, but not against direct viewing of the laser beam or reflections from metallic surfaces.

WARNING: Serious burns! Enclose the CO₂ laser beam path during service. Direct or diffuse laser radiation can seriously burn.

WARNING: Toxic fumes! Laser marking generates vapors, fumes, and particles that may be noxious, toxic, or even fatal.

Warnings, Cautions, and Safety Symbols

Special paragraphs in this manual warn you about potentially hazardous situations and recommend safe practices to help you avoid personal injury (Warnings) or damage to equipment (Cautions). They are included to help you use the system safely and efficiently.

Please follow these recommendations and also review the information in the Safety Summary beginning on page v.

Electrostatic Discharge (ESD) Precautions

The circuit boards inside the programmers are susceptible to electrostatic discharge (ESD), which can damage the circuitry of the programming electronics. Also, devices processed through the PS200/PS300 are very sensitive to static and can be damaged by accidental and unintended electrostatic discharge while being handled by an Operator.

The easiest way to prevent damage from ESD is to make sure a common static potential (ground) exists between the static-sensitive device or component, its environment, and you.

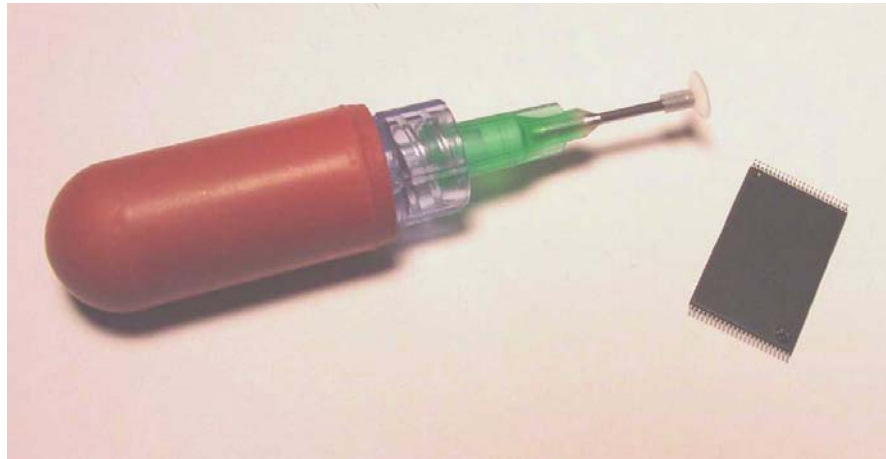
Handling Devices Safely

To prevent damage to device leads, use the vacuum tool to move devices or to pick them up if they drop. The vacuum tool is designed to handle devices without damaging them.

CAUTION: *Do not touch devices with your hands or any implement other than the vacuum tool.*

To pick up a device using the vacuum tool, place its rubber tip on the device body, press gently until the tip holds the device, and lift it up.

Figure 1-7. Vacuum Tool and Sample Device



2 Setup

Before you actually process devices, there are seven tasks you need to complete in order to set up the PS200/PS300 to run a job.

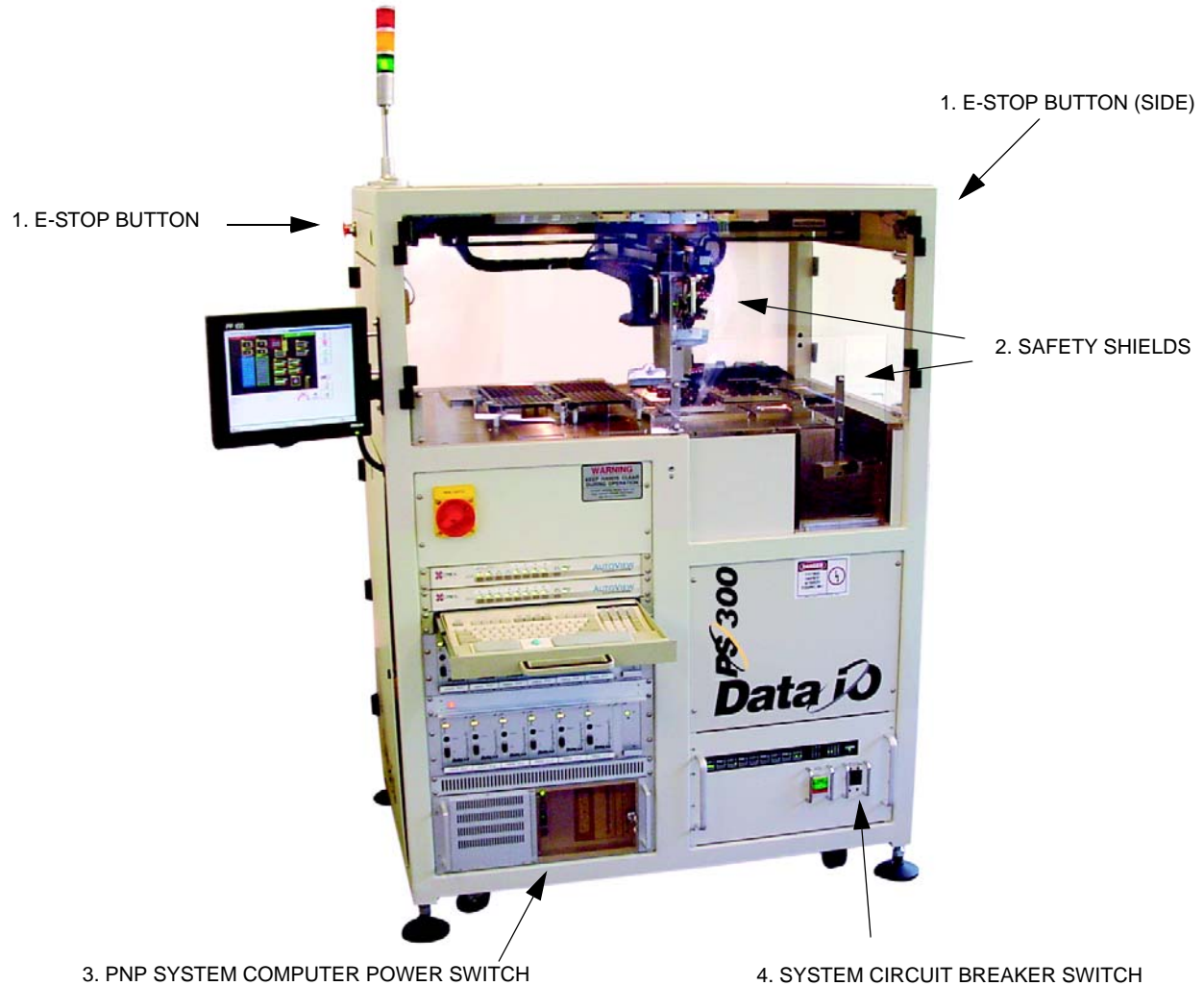
The *Setup* chapter describes these seven tasks:

- “Task 1: Prepare the PS200/PS300 for Operation” on page 2-2
- “Task 2: Turn On System Power” on page 2-4
- “Task 3: Load a Task” on page 2-5
- “Task 4: Set the Options Tab” on page 2-8
- “Task 5: Verify the Task Info Tab” on page 2-10
- “Task 6: Set Marker Options” on page 2-11
- “Task 7: Load Unprogrammed Devices (Tubes or Trays)” on page 2-13

Task 1: Prepare the PS200/PS300 for Operation

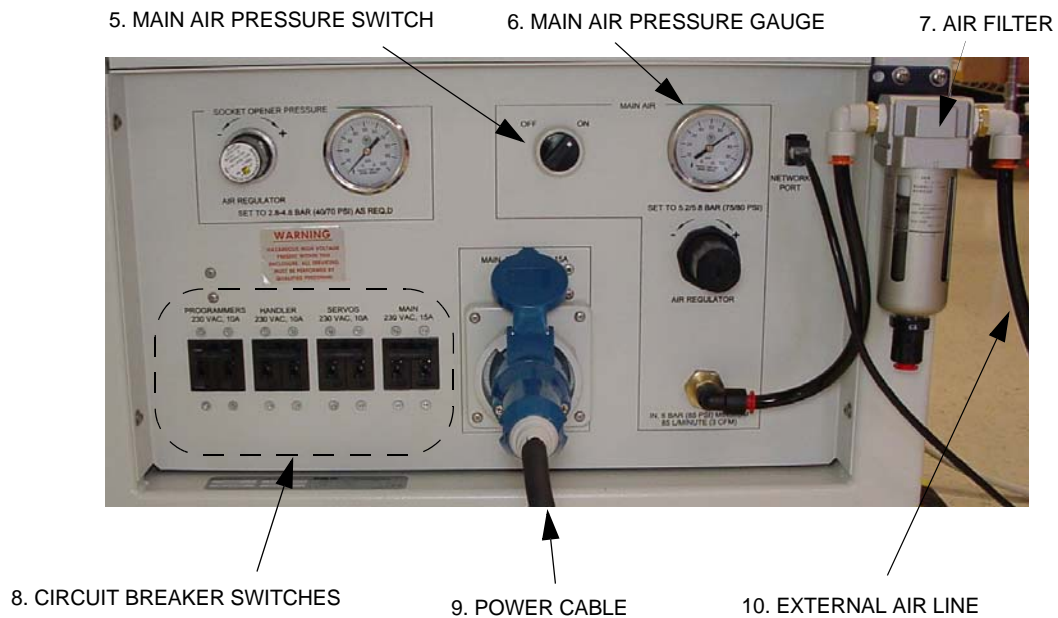
The first task in setting up is to prepare the PS200/PS300 for operation. To prepare the PS200/PS300 for operation, complete these eleven steps:

Figure 2-1. PS200/PS300: Front View



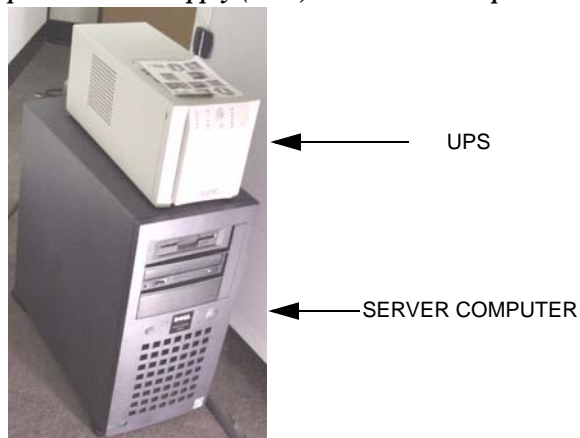
1. Check that both **E-Stop Buttons** are in the released (operating) position (see Figure 2-1).
2. Check that all **Safety Shields** are closed (see Figure 2-1).
3. Check that the **PNP System Computer Power Switch** is in the **ON** position (see Figure 2-1).
4. Check that the **System Circuit Breaker Switch** is in the **ON** position (see Figure 2-1).

Figure 2-2. PS200/PS300: Partial Back View



5. Check that the **Main Air Pressure Switch** is in the **ON** position (see Figure 2-2).
6. Check that the **Main Air Pressure Gauge** is set to approximately 80 PSI (see Figure 2-2).
7. Check that the **Air Filter** is properly installed (see Figure 2-2).
8. Check that the four **Circuit Breaker Switches** are in the **ON** position (see Figure 2-2).
9. Check that the **Power Cable** is attached (see Figure 2-2).
10. Check that the **External Air Line** is connected (see Figure 2-2).

Figure 2-3. Uninterruptable Power Supply (UPS) and Server Computer



11. Check that the **Uninterruptable Power Supply (UPS)** and **Server Computer** are connected and turned on (see Figure 2-3).

Note: Also check that the adapters for the job you want to run are installed on all programmer sites. See your PS200/PS300 System Supervisor for specific information.

Task 2: Turn On System Power

After you prepare the PS200/PS300 for operation, the second task is turning on the system power. To turn on system power, complete these three steps:

Figure 2-4. PS200/PS300: Front View



1. Turn the **Main Switch** to the right (see Figure 2-4).
2. Press the **System ON/OFF Button** so the green light comes on (see Figure 2-4).
3. Verify that the network log-on script is displayed on the touch screen monitor.

Task 3: Load a Task

After turning on the system power, you're ready to load a job. To load a job, follow these seven steps:

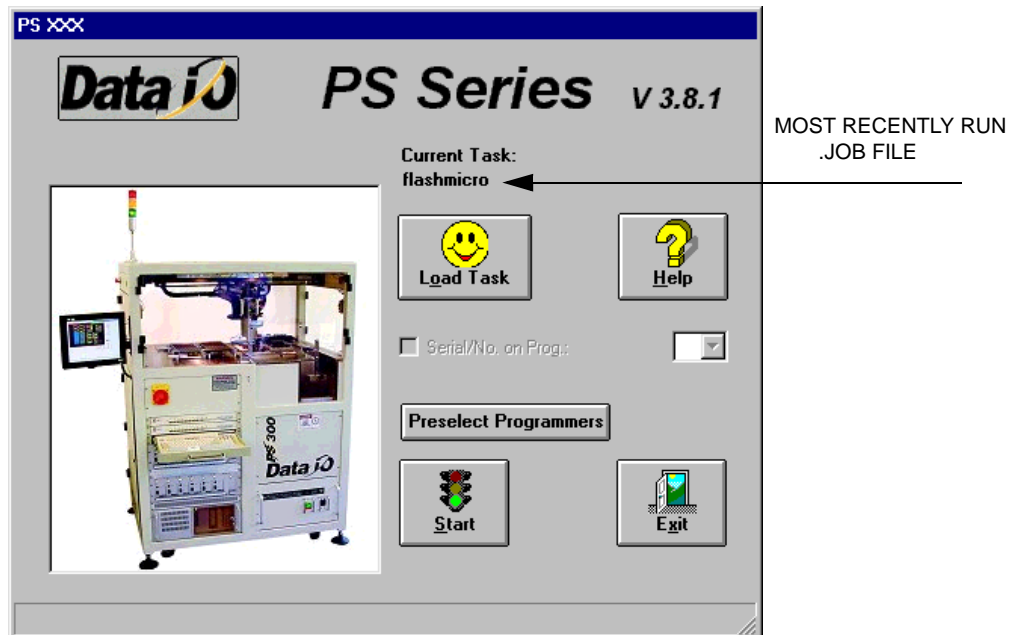
1. On the AutoView Upper Switch Box, press **A**.

Figure 2-5. AutoView Switch Boxes



2. Select the **PS200/PS300** icon (by either moving the cursor and clicking the icon or by touching the icon on the touch screen monitor). This opens the **PS200/PS300** window.

Figure 2-6. PS200/PS300 Window

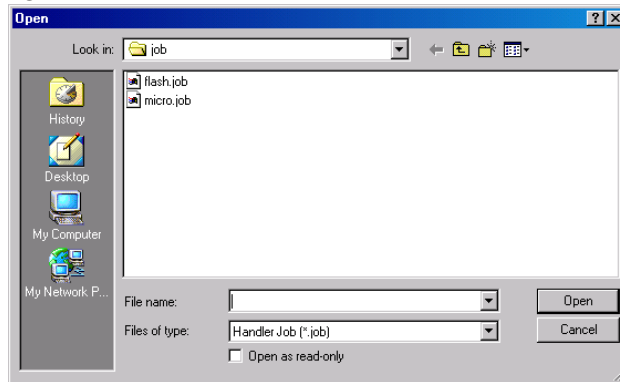


3. Notice that the name of the most recently run **.job** file (in this example, flashmicro) appears near the top of the **PS200/PS300** window.

Note: If you want to run this job again, skip to Step 6. If you want to run a different job, continue with Step 4.

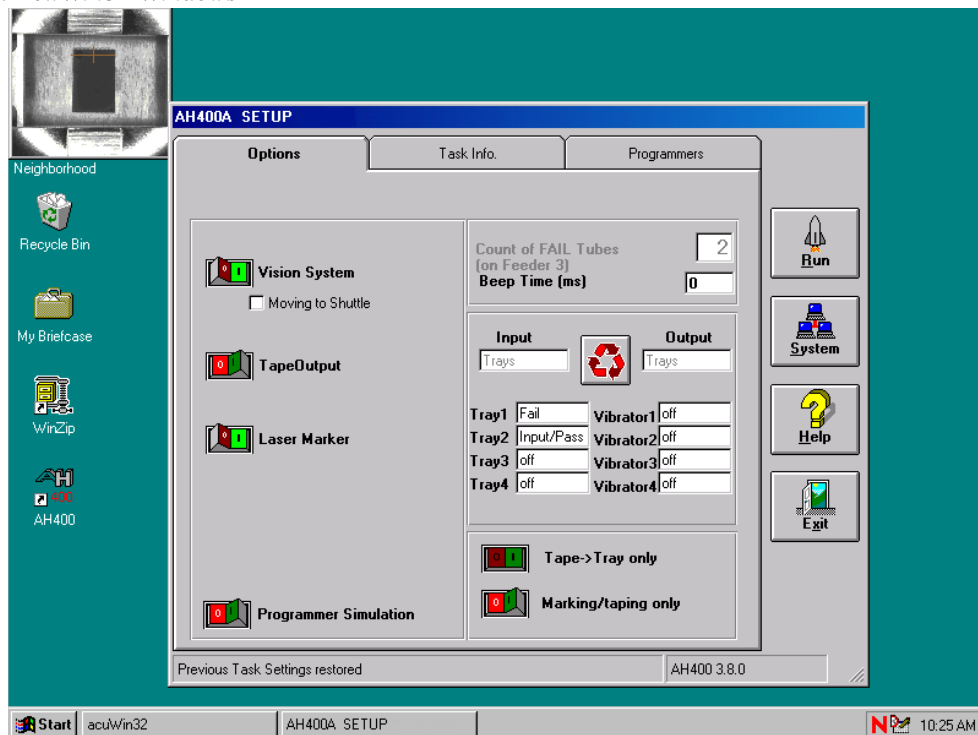
4. On the **PS200/PS300** window, click **Load Task** to open the standard Windows **Open** dialog box.

Figure 2-7. Open Dialog Box



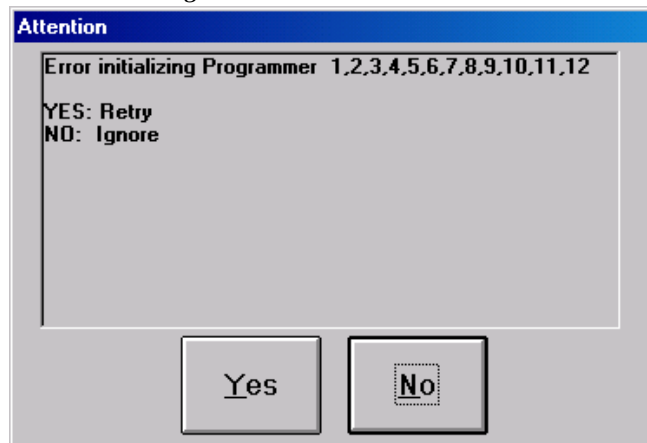
5. Select the **.job** file you want, and then click **Open**. This file name now appears near the top of the **PS200/PS300** window.
6. Click **Start**. The PS200/PS300 lights turn on. It may take several minutes for the PS200/PS300 to download the job file and establish communications with the programmers. When the download is complete and communications are established, the **Setup** and **AcuWin32** (camera) windows are open.

Figure 2-8. Setup and AcuWin32 Windows



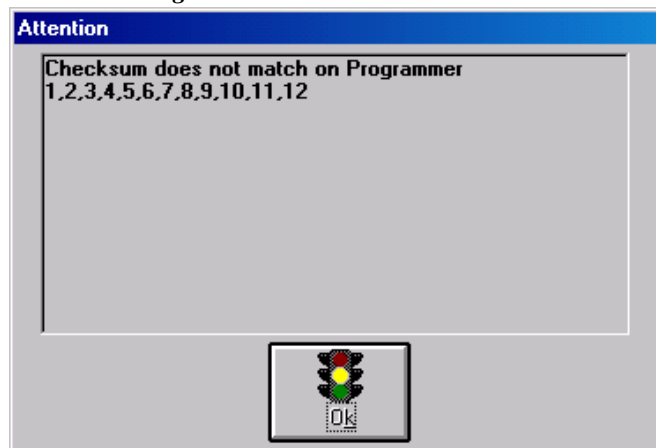
7. If you see the error message “Error initializing Programmer #,” check that the correct adapters are installed on the programmers, and then click **Yes** to retry initializing the programmer(s).

Figure 2-9. Programmer Error Message



If the message reappears, you can click **No** to proceed with some programmers not operating. After clicking **No**, a second error message appears:

Figure 2-10. Checksum Error Message



Click **OK** to continue.

More Information:

“Re-initialize Programmer Sites” on page 5-4

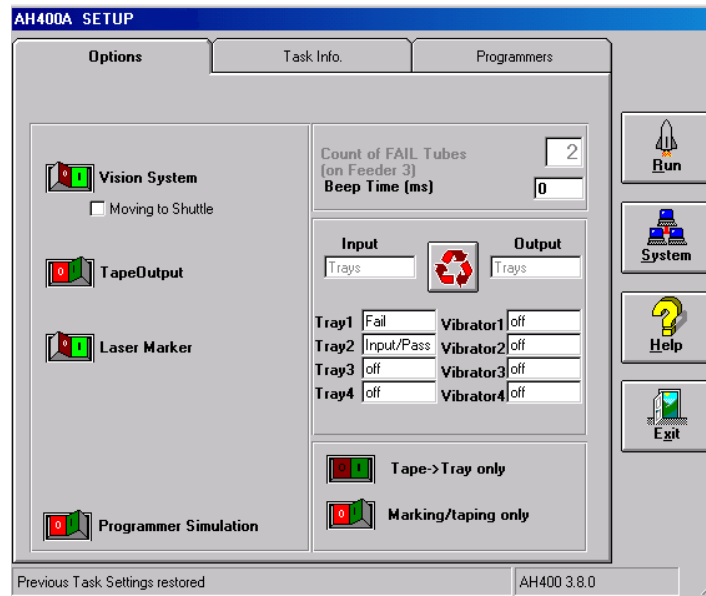
Task 4: Set the Options Tab

Once you've loaded a job, you're ready for the fourth task: setting the **Options** tab on your PS200/PS300. Information you enter on the **Options** tab directs the PS200/PS300 to configure itself to run the job you just loaded.

To set the **Options** tab, follow these nine steps:

1. On the **Setup** window, select the **Options** tab.

Figure 2-11. Options Tab




2. Click the  button to toggle to the input-output configuration you want.

Figure 2-12. Input-Output Configurations

| Input | Output |
|-------|--------|
| Trays | Trays |
| Tubes | Tubes |
| Tape | Trays |
| Tape | Tubes |
| Tubes | Trays |
| Trays | Tubes |

3. If you want Tape output, select a configuration with the input you want and the output for failed devices (tray or tube), and then click the **TapeOutput** switch to the ON position.
Note: Make sure that the taping machine power switch is in the ON position.
4. Click in the available **Tray** or **Tube** text boxes to select the appropriate media settings for the job you are running. Choices include: input/pass, input, pass, fail or pass/fail.
5. To move devices from tape to trays, click the **Tape to Tray only** switch. The PNP robot will then remove each unprogrammed device from the input tape and place it on the output tray.

6. To move devices from the input media to the marker pedestal for marking, and then to the output media without programming them, click the **Marking/taping only** switch.
7. To move devices from the input media to the tape output (whether they go through the marking process) without programming them, click the **Marking/taping only** switch.
8. Verify that the **Vision-System** switch is in the ON position.
9. Verify that the **Programmer Simulation** switch is in the OFF position.

Note: This switch is used for servicing only.

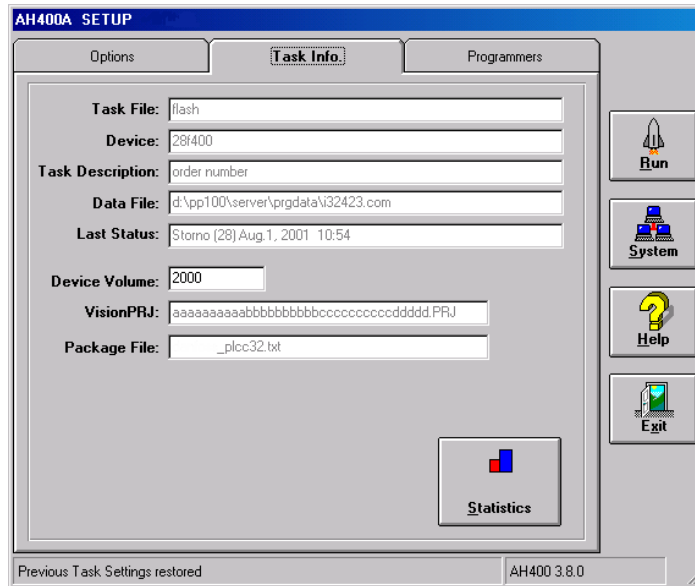
Task 5: Verify the Task Info Tab

Once you have set the **Options** tab, the fifth task is to verify information on the **Task Info** tab.

To verify the **Task Info** tab, complete these three steps:

1. On the **Setup** window, select the **Task Info** tab.

Figure 2-13. Job Info Tab



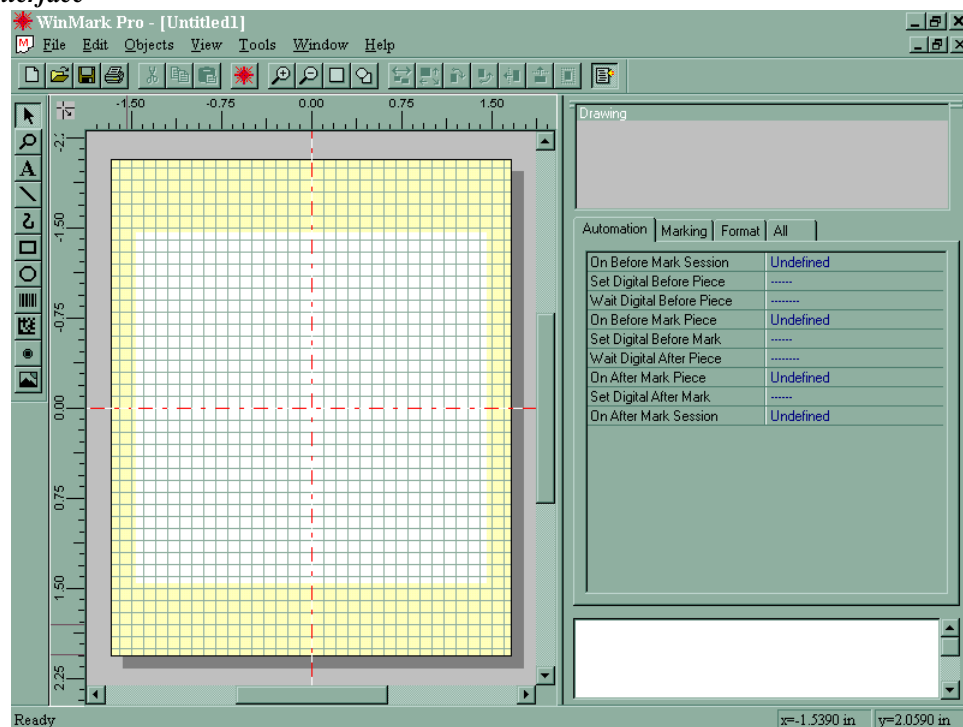
2. Verify that the **.job** file you selected is listed in the **Task File** text box.
3. Check the number of devices in the **Device Volume** text box. If the number of devices you want to process is different than what shows in the **Device Volume** text box, type the correct number.

Task 6: Set Marker Options

If the job calls for laser marking each device after it is processed, you will need to complete these steps to set marker options. After the marker options are set, the PS200/PS300 is responsible for starting the laser job's automation sequence.

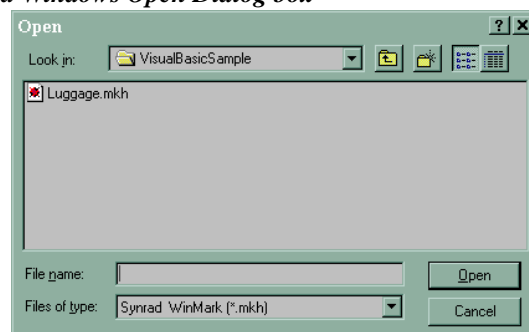
1. On the AutoView Upper Switch Box, press C.
2. Double-click the **Shortcut to WinMark** icon.
3. Select **WinMark Pro**, and then click **OK** to open the laser interface.

Figure 2-14. Laser Interface



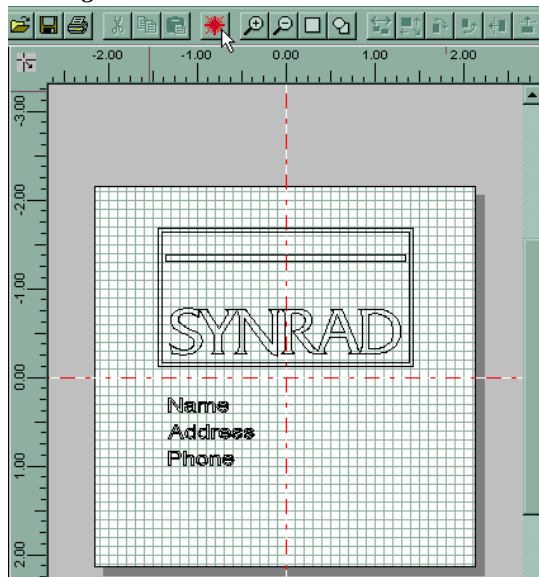
4. Click **File**, click **Open**, and then select the laser file you want.

Figure 2-15. Standard Windows Open Dialog box



- Click **Open**. The drawing appears on the canvas.

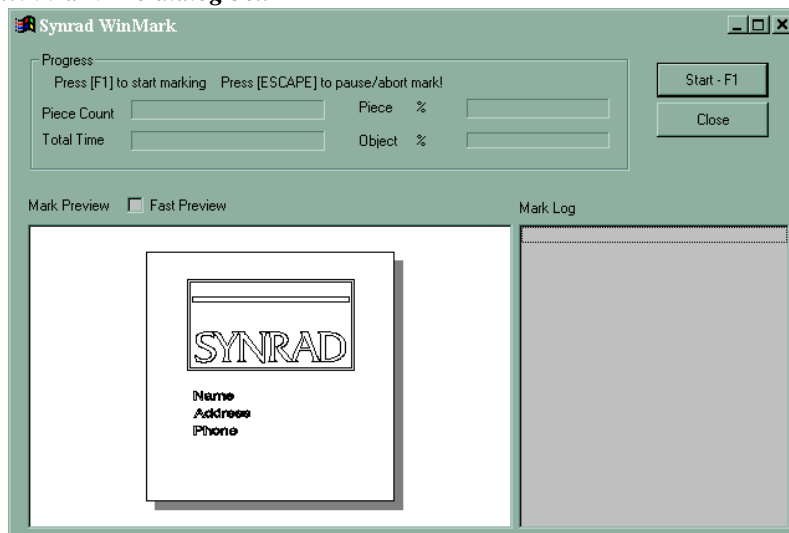
Figure 2-16. Sample Drawing and Mark Button



- Click the **Mark** button on the Shortcut Bar to open the **Synrad WinMark Pro** dialog box.

WARNING: Blindness, serious burns, and toxic fumes may result from not following safety precautions in this manual and the laser marker manuals. Do not operate the laser marker unless the safety shields and case apertures are closed, and the fume extractor filters have been replaced on schedule.

Figure 2-17. Synrad WinMark Pro dialog box



- Click **Start - F1** to initiate the laser automation sequence. The laser will fire upon command from the software.

Task 7: Load Unprogrammed Devices (Tubes or Trays)

The last task in setting up the PS200/PS300 is to load the unprogrammed devices. Whether loading unprogrammed devices from tubes or trays, be sure to meet these two important conditions:

1. Load unprogrammed devices on the PS200/PS300 by placing them right-side-up (sometimes referred to as “live bug”) with the device leads pointing toward the floor so the manufacturer’s name, the part number, and other identifying marks are visible on the top of the device.
2. Orient the unprogrammed devices so that Pin 1 on the devices matches the Pin 1 orientation for the job you are running. Ask your PS200/PS300 System Supervisor for the Pin 1 orientation for trays and tape input as defined by your company.

CAUTION: If the Pin 1 orientation does not match the defined orientation, the PNP robot will rotate the device based on the information in the job and will insert it incorrectly in the socket. This may damage the device leads and the socket contacts.

3 Operations

Once you have completed the seven tasks described in *Setup*, you're ready to process devices. When you process devices, the PNP robot takes unprogrammed devices from input media, places them in a programmer socket, and performs a series of programming tests and operations. Devices are then moved to either the marking pedestal or the output media. As the Operator, you direct the PS200/PS300 as it completes these operations.

The *Operations* section describes the most frequently performed PS200/PS300 operations:

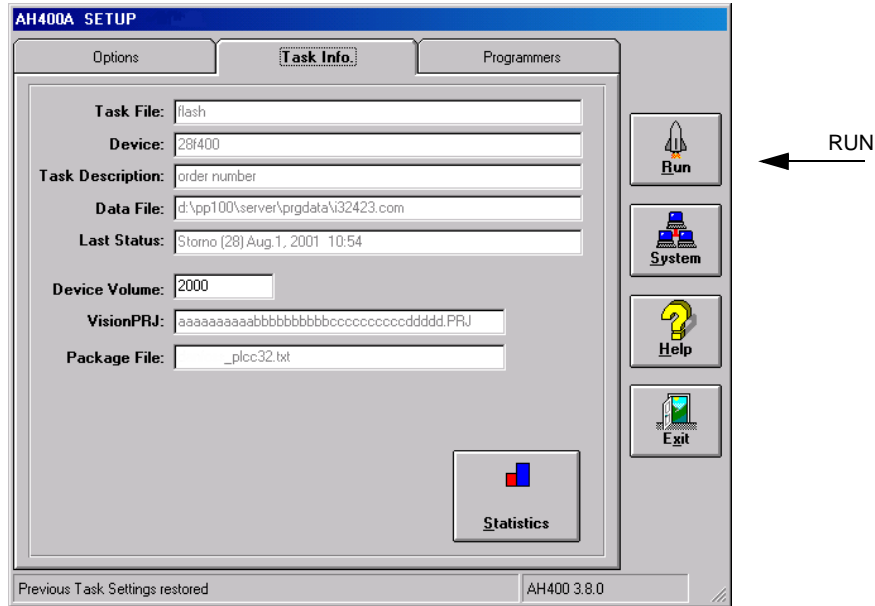
- “Start a Job” on page 3-2
- “Pause a Job” on page 3-3
- “Restart a Paused Job” on page 3-3
- “Clear All Devices from Programmers” on page 3-4
- “Use the E-Stop Button” on page 3-5
- “Restart a Job Stopped with the E-Stop Button” on page 3-5
- “End a Job” on page 3-6
- “Remove Programmed Media (Tubes or Trays)” on page 3-6
- “Shut Down the System” on page 3-6

Start a Job

After you complete the tasks described in the *Setup* section, you are ready to start a job. To start a job, complete these four steps:

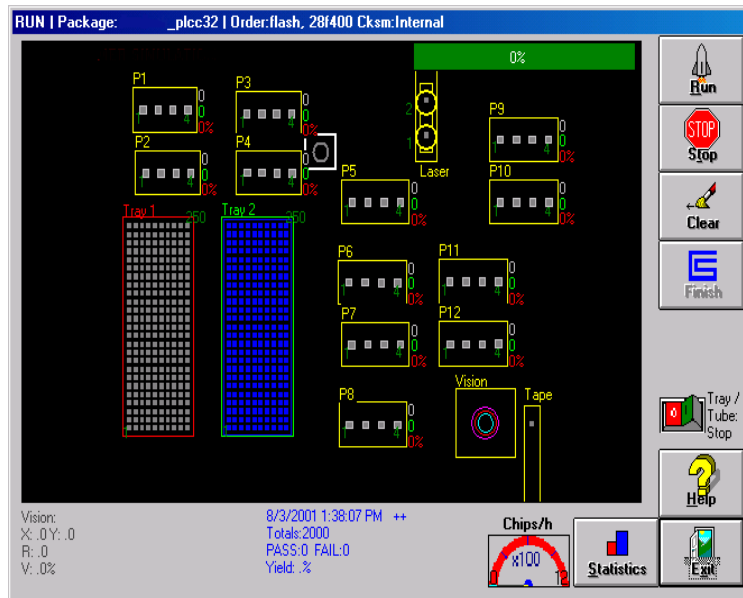
1. Make sure that the **Setup** window is open.

Figure 3-1. Setup Window: Run



2. On the **Setup** window, click **Run** to open the **Run** window.

Figure 3-2. Run Window



WARNING: Do not continue until making sure that the safety shields are closed or personal injury may result.

- Click **Run**, follow the directions on the screen, and then click **Yes**. The PNP robot will move to the home position and then begin picking up and placing devices in sockets. State indicator lights will appear inside the programmer outlines, and the PNP robot's location will be tracked on the black part of the **Run** window.

*Note: If you selected tube input, the vibrators turn on after you click **Run**. To adjust vibration, use the tube feeder vibration adjustment knobs (see Figure 1-2).*

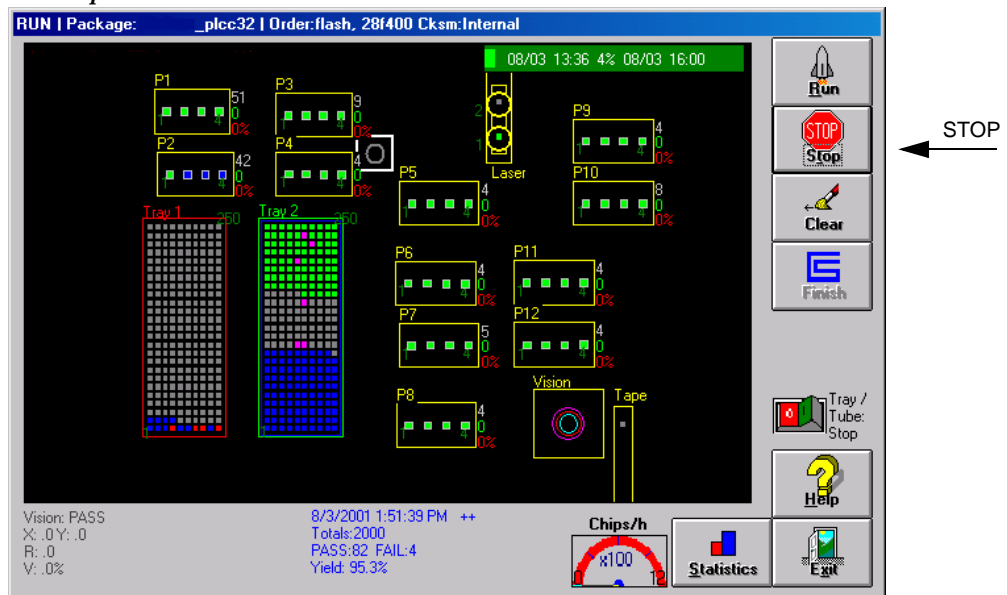
- If you want to end the job when the input tray or tube is empty, click the **Tray/Tube Stop** switch to the **ON** position.

*Note: You can click the **Tray/Tube Stop** switch while the job is running. If there are more devices in sockets than empty spaces in the "pass" module, the PS200/PS300 will load an additional tray or tube before stopping. To continue a job stopped in this way, click the **Tray/Tube Stop** off again and then click **Run**.*

Pause a Job

To pause a job, click **Stop** on the **Run** window. The PNP robot moves to the park position and the amber light on the Light Tower goes on. The PS200/PS300 is now in its idle state, and it is safe to open a safety shield.

Figure 3-3. Run Window: Stop



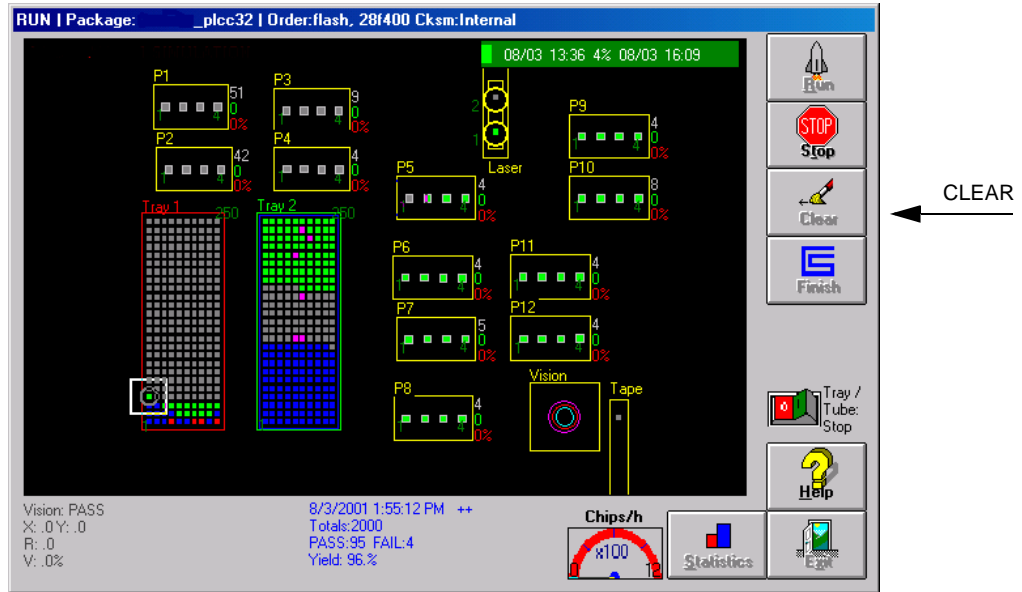
Restart a Paused Job

To restart a paused job, click **Run** to continue running the job from where it left off.

Clear All Devices from Programmers

If you want to remove all the devices that are currently in programmers and place them in the fail tube or tray, click **Clear** on the **Run** window.

Figure 3-4. Run Window: Clear



Use the E-Stop Button

To prevent bodily injury or damage to equipment in an emergency, press the red **EMERGENCY STOP** (E-Stop) button located on either side of the system (see Figure 2-1). This stops all movement on the PS200/PS300 immediately. The message “Check Doors/E-Stop!” is displayed on the touch screen monitor.

WARNING: The STOP button on the PS200/PS300 window is not an E-Stop button. It allows the PNP robot to continue moving at full speed until the current operation is complete.

Figure 3-5. E-Stop Button



Restart a Job Stopped with the E-Stop Button

To restart the system, turn the E-Stop button clockwise until it springs back to its full height, and clear the “Check Doors/E-Stop!” message from the touch screen monitor by clicking **OK**. The PS200/PS300 will then resume the job without further input from you.

Note: If the air pressure drops below a factory-set threshold, you cannot run a job. Check the air pressure or see your PS200/300 System Supervisor.

End a Job

To complete the current programming cycle, remove devices from the sockets, and place them in the appropriate output or reject modules, click **Finish** on the **Run** window.

Remove Programmed Media (Tubes or Trays)

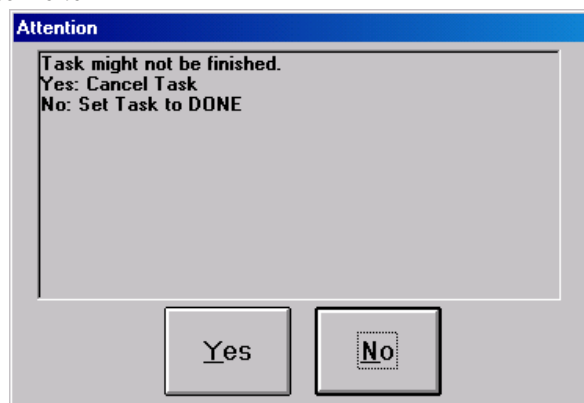
Once a job is finished and all devices are programmed, remove and store programmed devices according to your company's instructions.

Shut Down the System

Occasionally you may want to completely shut down the PS200/PS300 system—for instance when the PS200/PS300 is not to be run overnight or before major service or replacement procedures. To shut down the system, follow these five steps:

1. Complete any jobs that are running.
2. If you wish to shut down without completing a job, click **No** to set the task to DONE:

Figure 3-6. Set Task to Done



3. Remove all devices from the system.
4. Exit the software and shut down Windows.

Note: If you have the laser option, you must also exit the WinMark Pro software and shut down that computer.

5. Turn the Main Switch (see Figure 2-4) to the **OFF** (vertical) position.

Note: The switch is designed to allow you to put a lock through it so it cannot be turned back on while the lock is in place.

4 Monitoring

As the PS200/PS300 Operator, you are probably responsible for running several machines at the same time. While machines are running, you monitor them to see that each one is operating efficiently. Several features of the PS200/PS300 make it easy to monitor machine operation.

The *Monitoring* section describes how these PS200/PS300 features help you monitor machine efficiency:

- “Light Tower” on page 4-2
- “State Indicator Lights on the Run or Gantry Windows” on page 4-3
- “PNP Head Movement on the Run or Gantry Windows” on page 4-5
- “LEDs on the Programmer Sites” on page 4-6

Light Tower

The light tower helps you monitor the status of the PS200/PS300 from a distance while the system is processing devices.

The three lights on the tower indicate different system conditions. Operator actions for each of the system conditions are described here:

Figure 4-1. Red (or Blue) Light

| Red (or Blue) Light | Operator Actions |
|---|---|
| PS200/PS300 is stopped, without operator action, because there is an error condition. | <ul style="list-style-type: none"> ■ Conditions that cause a red (or blue) light usually require the intervention of the PS200/PS300 System Supervisor. Note which of these conditions exist and contact the appropriate person: <ul style="list-style-type: none"> ■ Tape output fault state ■ PNP motion error ■ Other mechanical errors |

Figure 4-2. Amber Light

| Amber Light | Operator Actions |
|---------------------------------------|--|
| PS200/PS300 is running or has paused. | <ul style="list-style-type: none"> ■ If all devices in the input tray/tube have been processed, load new unprogrammed devices. <ul style="list-style-type: none"> 📖 More Information: “Task 7: Load Unprogrammed Devices (Tubes or Trays)” on page 2-13. ■ If the output trays or tubes are full, remove processed devices. <ul style="list-style-type: none"> 📖 More Information: “Remove Programmed Media (Tubes or Trays)” on page 3-6. |

Figure 4-3. Green Light

| Green Light | Operator Actions |
|-------------------------|---|
| PS200/PS300 is running. | <ul style="list-style-type: none"> ■ No Operator action is needed. |

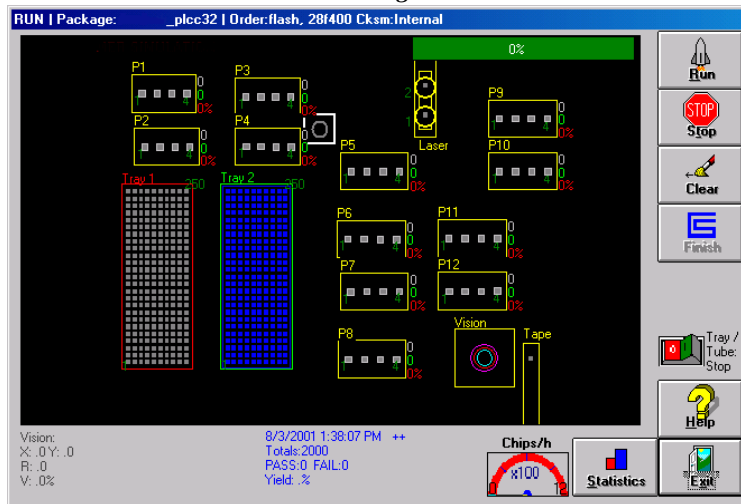
State Indicator Lights on the Run or Gantry Windows

State indicator lights on the **Run** or **Gantry** windows help you monitor how efficiently the PS200/PS300 system is operating. Different colored state indicator lights report the status of:

- individual devices in the input or output media
- individual sockets
- whole programmer sites

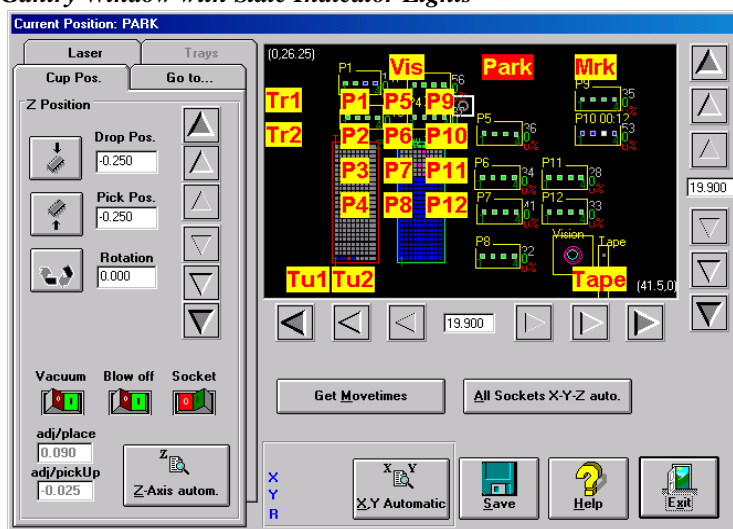
The **Run** window displays state indicator lights for input and output media, individual sockets and programmer sites. Below is an example of the **Run** window with state indicator lights:

Figure 4-4. Run Window with State Indicator Lights



The **Gantry** window displays and labels locations inside the work envelope. Below is an example of the **Gantry** window with state indicator lights showing the status of various locations.

Figure 4-5. Gantry Window with State Indicator Lights



Below is a chart which explains the meaning of the different state indicator lights on the **Run** or **Gantry** windows.

Figure 4-6. State Indicator Lights

| Color | Indicates | Explanation |
|---------------------------------|-----------------------------|--|
| GREEN | ■ Pass | ■ Device successfully processed |
| BLUE | ■ New chip | ■ Device new and not yet processed |
| RED | ■ Fail | ■ Device failed to program correctly |
| PINK (on input media) | ■ Vacuum error | ■ No device found in expected input media location |
| PINK (on programmer) | ■ Vacuum error | ■ No device found in expected programmer location |
| PINK (on programmer) | ■ Pick failure | ■ Device could not be picked up by PNP head |
| PINK (on programmer) | ■ Empty Socket Test failure | ■ Recurrent Empty Socket Test found a device where none was expected |
| YELLOW | ■ Programming | ■ Device currently being programmed |
| BLACK | ■ Disabled | ■ Socket disabled; not being used to program devices |
| GRAY | ■ Empty | ■ No device in the socket/tray location |
| WHITE | ■ Continuity error | ■ Device did not program because of continuity error |

PNP Head Movement on the Run or Gantry Windows

On the PS200/PS300 **Run** and **Gantry** windows, you can monitor the movement of the PNP robot as it picks and places devices during a programming job.

During a typical job, the PNP robot:

1. Picks up an unprogrammed device from the input media
2. Moves it over the vision system camera to fine-tune its position
3. Places it in a programming socket
4. Picks it up again after it is programmed
5. Moves it to the laser marking pedestal (optional)
6. Picks it up and moves it to the appropriate output media

The **Run** and **Gantry** windows display these movements of the PNP robot.

When you click **Stop** on the **Run** window, the PNP robot moves to the “park” position and waits for further instruction from you. Movement of the PNP robot to the park position is displayed on the **Run** window.

When you push an E-Stop button, the PNP robot moves to the “home” position and waits for further instruction from you. Movement of the PNP robot to the home position is displayed on the **Run** window.

 **More Information:**

“Change the State of a Device after a Vacuum Error” on page 5-3

“Disable a Programmer Site” on page 5-5

LEDs on the Programmer Sites

Colored LEDs on programmer sites help you monitor programming operations on the PS200/PS300.

PS200/PS300 systems can be configured with universal programmers which contain a single socket, or FlashTOP programmers which contain four sockets, or a combination of both programmer types.

Universal Programmer Sites

On a universal programmer site the single LED indicates the status of the device in the single socket.

The chart below explains the meaning of the colored LED on a universal programmer:

Figure 4-7. LED on Universal Programmer Site

| LED | Indicates | Explanation |
|---------------|---------------|--|
| GREEN | ■ Pass | ■ Device in socket successfully programmed |
| RED | ■ Fail | ■ Device in socket failed to program correctly |
| YELLOW | ■ Programming | ■ Device in socket currently being programmed |

FlashTOP Programmer Sites

On a FlashTOP programmer site there are five LEDs

- four socket LEDs indicate the status of the device in each of the four sockets
- one programmer LED reports the status of the entire programmer site

During programming on a FlashTOP, all socket LEDs are off and the programmer LED is yellow. If one device fails to program and three devices pass, the programmer LED is off, the passed socket LEDs are green, and the failed socket LED is red. If a device has a continuity error, the programmer LED is yellow until the device is replaced with another. The other sockets do not start programming until the “failing” socket either has a new chip or has been disabled.

The chart below explains the meaning of the colored LEDs on a FlashTOP programmer.

Figure 4-8. LEDs on FlashTOP Programmer Site

| LED | Indicates | Explanation |
|-----------------------------------|--------------------|--|
| GREEN (on socket) | ■ Pass | ■ Device in socket successfully programmed |
| RED (on socket) | ■ Fail | ■ Device in socket failed to program correctly |
| YELLOW (on programmer) | ■ Programming | ■ Devices in sockets currently being programmed |
| LED off (on programmer) | ■ Process complete | ■ Check individual sockets for pass or fail status |

5 Troubleshooting

Sometimes you may notice that the PS200/PS300 is operating at less than maximum efficiency. Maybe a programmer site failed to initialize and devices aren't being programmed on that site. Or maybe a device was dropped and didn't get programmed. These error conditions are easily corrected.

The *Troubleshooting* section describes these error recovery procedures:

- “Check for a Dropped Device” on page 5-2
- “Change the State of a Device after a Vacuum Error” on page 5-3
- “Re-initialize Programmer Sites” on page 5-4
- “Disable a Programmer Site” on page 5-5

Check for a Dropped Device

Sometimes during movement of the PNP robot, a device is dropped, perhaps because of an unexpected change in the vacuum pressure.

To check for a dropped device, complete this procedure:

1. The alarm message “Chip lost!” displays when a device is dropped. The PNP robot returns to the park location. Open a safety shield and locate the dropped device inside the work envelope.

Figure 5-1. “Chip Lost” Alarm Message

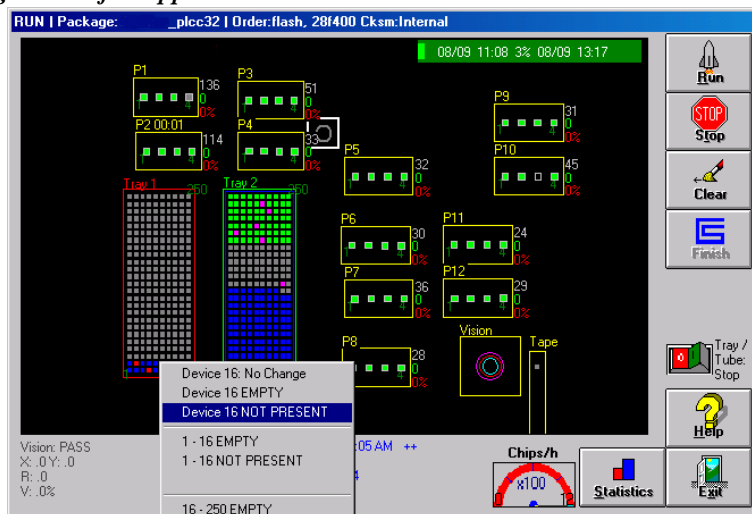


2. Once you locate the dropped device, use the vacuum tool to pick it up.

Note: Below is a suggested procedure. Check with your PS200/PS300 System Supervisor about your company's policy for a dropped device.

3. Place the device in the “fail” output tray.
4. Click **OK** on the “Chip lost!” alarm message.
5. On the **Run** window, click on the device in the “fail” output tray and click “Not Present.”

Figure 5-2. Changing Status of Dropped Device



Note: Clicking “Not Present” directs the system not to place another device in this location.

6. Press **Run** on the **Run** window to resume the job.

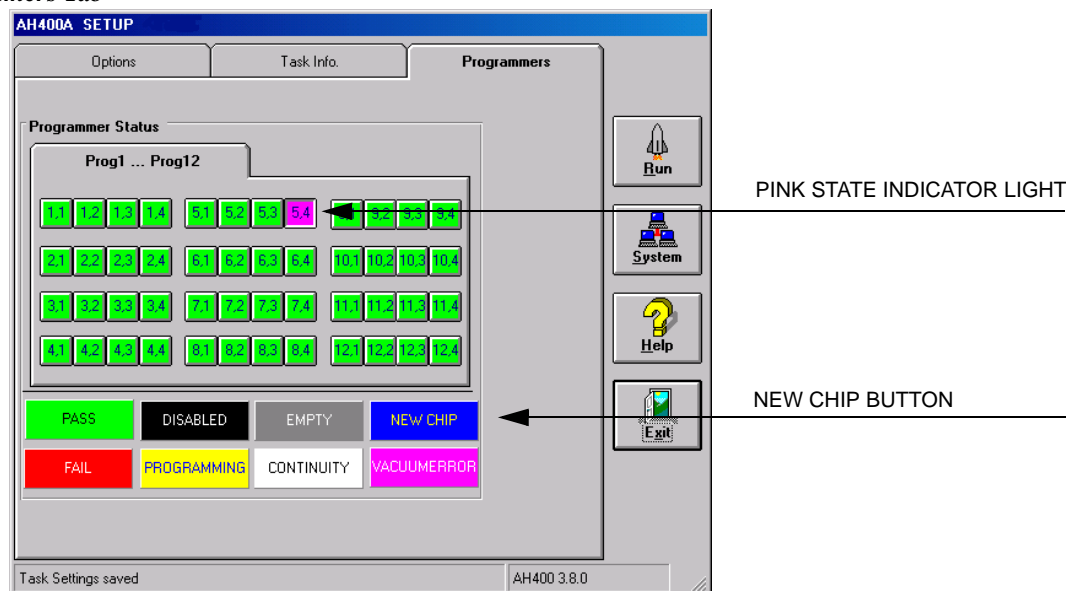
Change the State of a Device after a Vacuum Error

A pink state indicator light for a device in a programmer socket indicates a vacuum error for that device. But the vacuum error state light doesn't tell you the actual condition of that device, which may be new, already programmed, or a failed device.

To check whether the device is new, has already been programmed, or is a failed device, complete this procedure:

1. On the **Run** window, click **Stop** and **Exit** to return to the **Setup** window.
2. Using a vacuum tool, pick up the device and set it back into the socket so that it makes contact with the leads.
3. On the **Setup** window, select the **Programmers** tab.

Figure 5-3. Programmers Tab



4. Click on the pink state indicator light of the device.
5. Click on the **NEW CHIP** (blue) button. The state indicator light for the selected device then changes to **BLUE** if the device is new, **GREEN** if it is passed, or **RED** if it is failed.
6. Click **Run** to return to the **Run** window.
7. Click **Run** to resume the job.

Re-initialize Programmer Sites

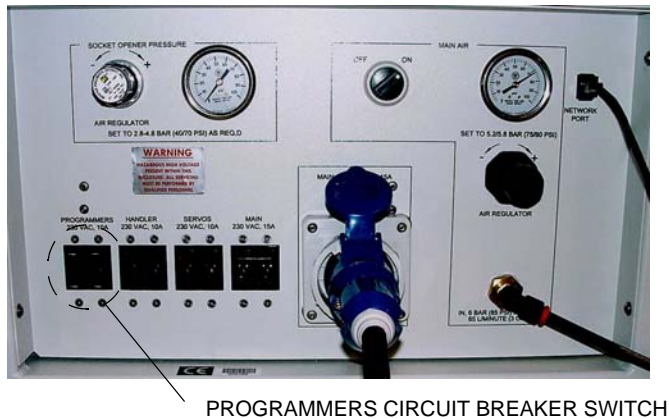
While loading a task, you may see the message “Error initializing Programmer #.” This may have occurred because there is a file conflict, or an adapter is missing, or for other reasons.

To re-initialize programmer sites, complete this procedure:

1. Check that the correct adapters are securely inserted onto the programmer sites.
2. Turn off and then back on the Programmers Circuit Breaker Switch on the back of the PS200/PS300.

Note: Wait until all programmers have booted and logged in.

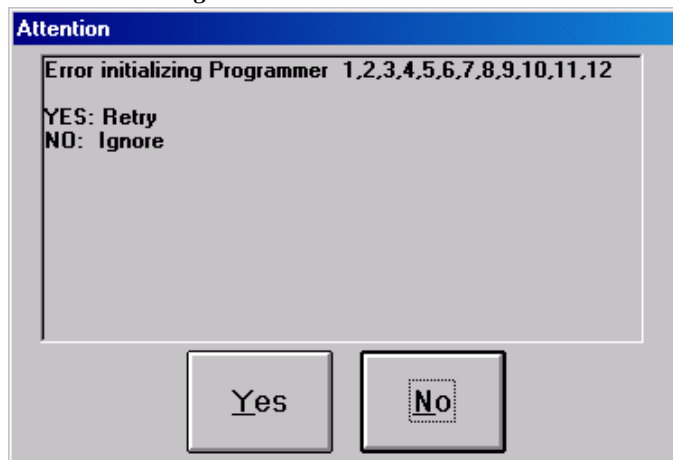
Figure 5-4. Programmers Circuit Breaker Switch



PROGRAMMERS CIRCUIT BREAKER SWITCH

3. Click **Yes** on the Programmers Error Message dialog box.

Figure 5-5. Programmers Error Message



4. If the error message does not return and the green LEDs on all programmer sites are lit, all programmers are re-initialized.
5. If the error message returns, note which programmer sites display red LEDs, and then contact your PS200/PS300 System Supervisor.

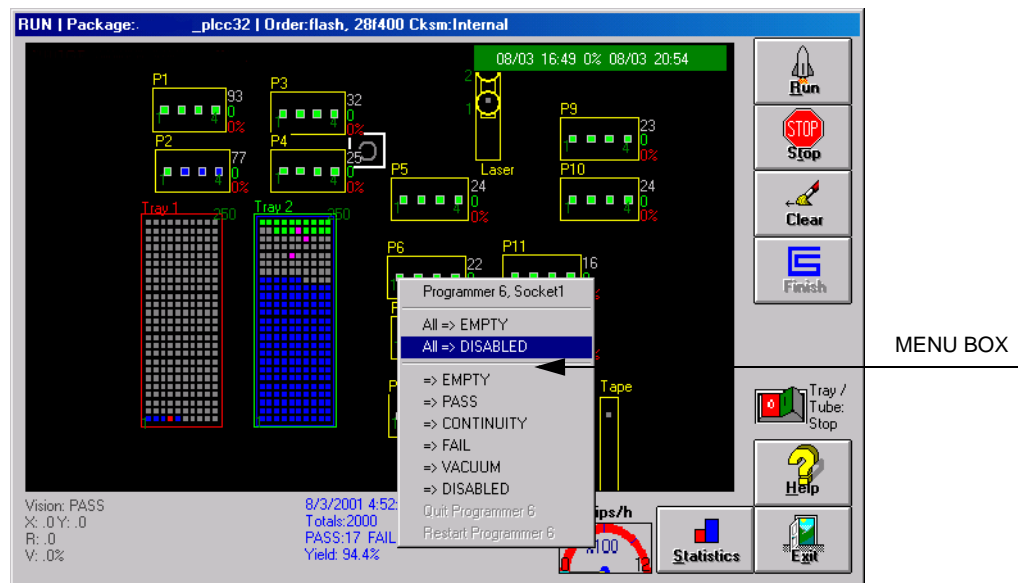
Disable a Programmer Site

You can disable a programmer site because it is producing too many failed devices or vacuum errors, or simply because you want to bypass an unused programmer site in order to optimize throughput.

To disable a programmer site, follow this procedure:

1. Click **Stop** on the **Run** window.
2. Click on the programmer site to open the menu box.

Figure 5-6. Menu Box on Run Window



3. Click **all => disable**. The state indicator light for this programmer site then changes to black on the **Run** window and the programmer site is skipped by the PNP robot.
4. Click **Run** to continue the job.

